

OSHA ASBESTOS STANDARD 1926.58

DATE 3/9/88 TIME 6:00 AM

CELL SERVICE DOW PERSONNEL ATTENDED A MEETING WHERE THE BELOW NAMED ITEMS WERE DISCUSSED.

TRAINING PROGRAM REQUIREMENTS:

DR. CURRIER DISCUSSED:

1. HEALTH EFFECTS ASSOCIATED WITH ASBESTOS EXPOSURE.
2. THE RELATIONSHIP BETWEEN SMOKING AND ASBESTOS IN PRODUCING LUNG CANCER.
3. MEDICAL SURVEILLANCE PROGRAM AND ACCESS TO MEDICAL RECORDS.

BILL LEDFORD DISCUSSED:

A REVIEW OF THE OSHA STANDARD 1926.58.

DEAN WALTERS DISCUSSED:

1. STANDARD 1910.20 WHICH COVERS "ACCESS TO EMPLOYEE EXPOSURE RECORDS".
2. METHODS OF RECOGNIZING ASBESTOS.
3. THE APPROPRIATE WORK PRACTICES FOR PERFORMING THE ASBESTOS JOB.
4. THE NATURE OF JOBS THAT COULD RESULT IN EXPOSURE TO ASBESTOS. CONTROLS TO MINIMIZE EXPOSURE: ENGINEERING CONTROL, WORK PRACTICE, RESPIRATORS, HOUSEKEEPING PROCEDURES, HYGIENE FACILITIES, PROTECTIVE CLOTHING, DECONTAMINATION PROCEDURES, EMERGENCY PROCEDURES, AND WASTE DISPOSAL PROCEDURES.

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LEON ISAAC <u>Leon Isaac</u>	JAMES KELLY <u>James Kelly</u>
EVRES MALVEAU <u>E. Malveau</u>	ANDERSON MONROE <u>Anderson Monroe</u>
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Read

ASBESTOS

Asbestos is a generic term referring to various fibrous mineral silicates, including chrysotile (hydrated magnesium silicate), amosite (iron-magnesium silicate), crocidolite (sodium-iron silicate), tremolite (calcium-magnesium silicate), anthophyllite (another iron-magnesium silicate), and actinolite (calcium-magnesium-iron silicate).

The potential health hazard associated with exposure to asbestos results from inhalation of airborne fibers; small asbestos fibers can pass readily through the upper respiratory tract and be deposited in the terminal bronchioles of the lung. There they can produce a local irritation which the body attempts to overcome by initiating a tissue response resulting in the encapsulation of the fibers and consequent formation of "asbestos bodies". Asbestos fibers are the causative agents in cases of asbestosis, a progressive disease characterized by diffuse interstitial fibrosis and, at times, pleural changes of fibrosis and calcification. It is often evident by such clinical signs as rales and dyspnea. In its severe form, asbestosis can contribute to, and result in, death due to the inability of the body to obtain oxygen or the heart to pump blood through the scarred lungs.

Exposure to airborne fibers has also been associated with bronchogenic carcinoma (a malignancy of the interior of the lung), mesothelioma (a diffuse malignancy of the lining of the chest cavity or abdomen), and cancer of the stomach, colon, and rectum. Cigarette smoking can enhance the incidence of bronchogenic carcinoma from this substance.

In order to protect workers from such occupational hazards, the Occupational Safety and Health Administration (OSHA) has established and just recently revised a series of regulations intended to protect worker health and safety. OSHA has determined for example that exposure to the more than 0.1 fibers per cubic centimeter (fibers/cc) of air over a time weighted average (TWA) of 8 hours constitutes a hazard (action level) that must be rectified. Additionally, OSHA has established 0.2 fibers/cc over an 8 hour TWA as the Permissible Exposure Limit (PEL) above which level no employee shall be exposed without respiratory protective equipment.

The Environmental Protection Agency (EPA) has also promulgated guidelines governing asbestos safety and has established the level of 0.01 fibers/cc or less as clean air. In order to help meet this standard during asbestos removal projects, negative air pressure is established within the work area equal to or greater than 0.02 inches of water.



National Safety Council

Data Sheet
I-709-86

Asbestos

FEDERAL REGULATIONS concerning asbestos have been promulgated by a number of agencies—Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), Food and Drug Administration (FDA), and the Department of Transportation (DOT).

Properties

2. Asbestos is the common name for a family of inorganic fibrous mineral silicates. The most abundant form of asbestos is chrysotile white asbestos; 90 per cent of the asbestos most commonly used is this type. Some other forms are actinolite, amosite, crocidolite (blue asbestos), anthophyllite, and tremolite. "Asbestos fiber" means asbestos fibers longer than five micrometers.

3. Asbestos occurs as masses or bundles of long, silky fibers that must be separated from the other minerals. Individual fibers are very small and can only be seen with a microscope. All types of asbestos are fire-resistant and demonstrate a high degree of strength and wear-resistance. Chemically, asbestos is relatively inert.

Uses

4. There was a tremendous demand for asbestos during World War II for use as an insulating material in ship building. It has been used extensively for insulating building structural materials, piping, stoves, and furnaces. Asbestos has been incorporated into manufactured prod-

ucts such as: cement sheet and pipe, roofing and sealing compounds, paints, floor tile, friction products (such as brake shoes and clutch facings), and textiles.

5. Asbestos use is now limited principally to use in manufactured products in which the fibers are bound into the product, and are not likely to become air-borne. The use of asbestos in applications likely to produce fiber dust is being replaced in many products by such materials as glass fiber, ceramic fibers, and mineral wool, all of which still have a significant health hazard associated with their use. It should be noted that United States consumption of asbestos dropped from around 800,000 tons annually in the early 1970's to less than 400,000 tons in 1980 and 1981.

Toxicity

6. *Asbestosis* This chronic lung disease results from the reaction of the body to the presence of fibers in the lungs, producing a progressive lung calcification. X-rays of persons with advanced cases show opacities, extensive scarring, and the presence

of mineral particles of various shapes, known as "asbestos bodies."

7. *Carcinoma of the Lung* Studies have shown the evidence of lung cancer is significantly higher among asbestos workers who have been continuously exposed. There is also evidence of a synergistic relationship between cigarette smoking and exposure to asbestos. Epidemiological studies indicate that asbestos workers who smoke have a greater risk of developing a malignancy of the interior of the lung.

8. *Mesothelioma* This is a form of cancer affecting the lining of the chest cavity and the abdominal cavity. Although it is extremely rare in the general population which has not

The generally recognized containers for asbestos waste are six-mil-thick plastic bags, sealed in such a way as to make them leak-tight. When using plastic bags, it is important to minimize the amount of void space or air in the bag. This will help to minimize any emissions should the bag burst under pressure.



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clothing is removed, it should be cleaned using a vacuum cleaner equipped with a high efficiency particulate air filter. If practical, the respirator should be worn when clothing is being removed. The employer should encourage employees to shower, if exposure exceeds limits. The respirator should be the last item removed prior to showering.

Medical examinations

16. The employer must make available at his expense, preplacement, annual, and termination physical examinations to all employees engaged in occupations exposed to air-borne concentrations of asbestos fibers. OSHA specifies the nature of these examinations, the records that must be kept, and who may have access to these records. Supervisors have the responsibility to identify their employees as "asbestos workers" to their medical department.

Handling

17. The principal control methods are wetting, enclosing, exhaust ventilation, and dust collection. Situations involving the shipping of asbestos-contained insulation from piping or equipment located in a populated work area (such as laboratory, office or shop) should be handled on the basis of a safety work permit or other form showing written approval by an authorized official. The permit should stipulate all safeguards including wetting, aspirators, protec-

tive clothing, cleanup, packaging, post-cleanup inspection, and vacating of the work area by persons not fully protected.

18. All hand-operated and power-operated tools that may produce or release asbestos fibers in excess of the exposure limits, such as but not limited to saws, scorers, abrasive wheels, and drills, shall be provided with collection bags. In addition, EPA regulations restrict the release of asbestos fibers into the general atmosphere by demolition operations, manufacturing and processing of asbestos products, and in disposal of asbestos waste products.

19. The criterium for determining whether or not the concentration of asbestos fibers has reached a hazardous level is based on the number of fibers with a length of five micrometers or longer per cubic centimeter of sampled air. (See paragraph 9.) At two fibers greater than five micrometers in length per cubic centimeter of air, there are literally millions of fibers smaller than five micrometers, which can be inhaled per 8-hour workday.

Engineering controls

20. Properly designed ventilation systems and local exhaust systems are the preferred methods of achieving compliance with exposure limits. Local exhaust systems should meet the requirements of ANSI Standard Z9.2, 1979, *Fundamentals Governing the Design and Operation of Local Exhaust Systems*, which by re-

Landfilling is recommended as an environmentally sound isolation method of disposing of asbestos waste because asbestos fibers are virtually immobile in soil. Place waste containers in a trench, and completely cover within 24 hours with a minimum of six inches of non-asbestos material. For the final closure, add an additional 30 inches of compacted non-asbestos material; then grade and vegetate the area to prevent erosion.

ference has been incorporated by OSHA, 29 CFR 1910.94. Exhaust systems in processing plants must meet EPA requirements restricting the release of fibers to the general environment. Guidelines for design of ventilation systems may be found in *Industrial Ventilation: A Guide to Recommended Practice*, 16th Edition, published by the Committee on Ventilation, American Conference of Governmental Industrial Hygienists.

Storage and waste disposal

21. Any material that contains asbestos (except encapsulated fibers) should be stored in appropriately labeled, impermeable containers, in a manner and place that protects containers from physical damage. In addition to having labels on containers, it is recommended that the storage area display signs indicating the presence of loose asbestos materials.

22. The principal federal agencies concerned with the disposal of asbestos are OSHA and EPA. OSHA specifies packaging and labeling requirements for the protection of the worker; EPA regulates asbestos from the "cradle to the grave" under the *Toxic Substances Control Act*. The EPA regulations are aimed at protecting the general environment and the public and are somewhat more stringent than OSHA's. Assistance in interpreting and complying with these regulations may be obtained from EPA regional offices.

23. Many states have waste disposal regulations, and employers must be aware of these where applicable.

Containers

24. Manufactured products, in which asbestos fibers are encapsulated, are less likely to prevent a containment problem unless damaged.

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Here, a typical application of asbestos spray insulation is shown under an I-Beam and steel deck.

been exposed to asbestos, it may be triggered by exposure 30 to 35 years prior to the onset of the disease. Excesses of cancer at several other sites (i.e., esophagus, stomach, colon, and rectum) have been observed in exposed workers.

Exposure standards and recommendations

9. a. The OSHA regulation for asbestos, designated as 29 CFR 1910.1001, specifies a permissible exposure limit (PEL) of two fibers (longer than five micrometers) per cubic centimeter of air as an eight-hour time-weighted average and a ceiling concentration limit of 10 fibers (longer than five micrometers) per cubic centimeter of air.

b. The National Institute for Occupational Safety and Health (NIOSH) recommends an eight-hour time-weighted average of 0.1 fibers (greater than five micrometers in length) per cubic centimeter of air, and a peak concentration of 0.5 fibers (greater than five micrometers in length) per cubic centimeter of air based on a 15-minute sample period.

10. Fiber concentrations are determined by using a phase contrast microscope. Because there is a lack of specificity of this method for fiber identification, the use of supplementary methods such as electron microscopy is necessary for fiber identification in case of mixed fiber exposure. A relatively simple qualitative field test for the possible presence of asbestos in insulation material has

been developed by NIOSH, and test kits are available commercially. This field test level, however, is not a substitute for positive identification of fibers.

11. OSHA regulations specify the method of measuring air-borne concentrations of fibers, and spell out the requirements for personal and environmental monitoring. Employers must maintain records of the results for both personal and environmental monitoring, and employees must be allowed access to these records. Employers must also notify employees of the results of monitoring in writing, according to the requirements of 29 CFR 1910.20.

Personal hygiene

13. Because there are no acute manifestations, first aid in the usual sense is not necessary; however, control of atmospheric contamination and individual personal hygiene are important. Employees should be urged to abstain from smoking as long as they work with asbestos. Good hygiene and sound work practices are required in the workplace in order that asbestos fibers are not carried home.

Personal protective equipment

14. Respirators Because OSHA regulations govern the use of respirators to achieve compliance with exposure limits, employers should

be cognizant of the requirements of 29 CFR 1910.1001, "asbestos," and 1910.134, "respiratory protection." Some key highlights are as follows:

a. Respirators may not be used to control exposure except as an interim measure where controls are not feasible and where engineering controls are already in effect.

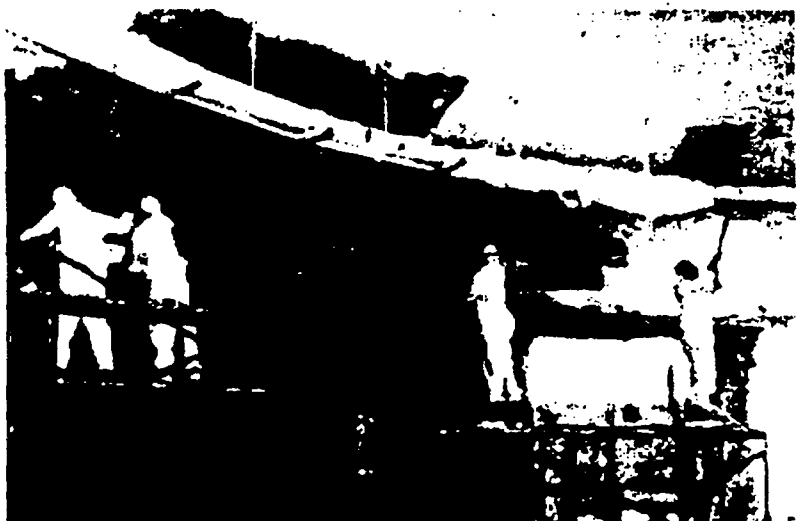
b. Respirators must be approved by NIOSH specifically for protection from asbestos. (Not all NIOSH-certified respirators are approved for asbestos protection.)

c. The type of respirator allowed depends upon the measured concentration of air-borne fibers.

d. The employer must establish a respirator program in accordance with the American National Standard *Practices for Respiratory Protection*, Z88.2-1980. The respirator program must include annual training, regular cleaning, inspection, recordkeeping, and medical examination and approval, and respirator fitting requirements.

15. Clothing OSHA regulations require employers to provide special clothing to be worn where air-borne concentrations exceed the ceiling exposure limits; clothing should also be provided when contact contamination can occur, regardless of air-borne concentration. This clothing must include whole-body covering such as coveralls, gloves, and head and foot coverings. For fixed places of employment, a change room must be provided with facilities such as lockers to assure that street clothing does not become contaminated with asbestos fibers. Before protective

Full body protection, including respiratory protection, is required when removing sprayed asbestos-containing material, such as from the concrete ceiling shown here.



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